

4.5.1.3 CSO Control Alternatives

The permit writer and the rest of the review team should consider the following questions when reviewing the CSO control alternatives:

- Did the permittee develop a comprehensive list of CSO control alternatives? Did this list include alternatives from each of the four general categories—source controls, collection system controls, storage, and treatment technologies—described in guidance for LTCPs (EPA, 1995a)?
- Did the permittee describe each CSO control alternative considered?
- Does the plan describe the process by which the CSO control alternatives were developed?
- Does the plan compare the environmental benefits of the CSO control alternatives?
- Is cost/performance information (including curves) for each of the CSO control alternatives provided? Do the cost/performance analyses evaluate a range of levels of controls that were developed based on the permittee's site-specific conditions (e.g., zero overflow events per year, and averages of 1 to 3, 4 to 7, and 8 to 12 overflow events per year)?
- Does the LTCP describe the approach used to screen the list of CSO control alternatives, including the recommended screening criteria? Do the screening criteria include performance factors, implementation and operation factors, such as costs, and environmental impacts (described in EPA's guidance for LTCPs [EPA, 1995a])?

4.5.1.4 Selected CSO Controls

When evaluating the CSO controls, the permit writer should consider the following questions:

- Is the presumption or demonstration approach used?
- Does the plan identify the reasons for selecting certain CSO controls and not others? Were reasons for rejecting specific CSO control alternatives appropriate?
- Have the NMC been integrated into the permittee's description of its selected CSO controls?

- Will the selected CSO controls eliminate all CSOs to sensitive areas? If not, do the data support the permittee's conclusion that elimination is not physically possible or economically achievable?
- If CSOs to sensitive areas remain:
 - Will these CSOs receive treatment?
 - Will the CSO controls be sufficient to provide for the attainment of WQS?
- Have control efforts for other point and nonpoint sources of pollutants within the watershed been considered?
- Will the CSO controls provide treatment or removal of floatables and settleable solids equivalent to that achieved by primary clarification? Is the mechanism for solids and floatables disposal described?
- Will the disinfection of effluent be necessary in order to attain WQS? If so, is disinfection proposed as part of the CSO controls, and will removal of harmful disinfection chemical residuals be necessary?
- Do the selected CSO controls provide the maximum pollution reduction benefits reasonably attainable?
- Will the selected CSO controls provide for the attainment of WQS? If WQS cannot be met because of sources other than CSOs, has the permittee provided information on the other sources and natural background conditions?
- Has a total maximum daily load (TMDL) been developed for the watershed? If so, has the permittee considered the TMDL in developing its LTCP?
- Are the selected CSO controls designed to allow cost-effective expansion or cost-effective retrofitting if additional controls are determined necessary to provide for the attainment of WQS?

4.5.1.5 Implementation Schedule

In reviewing the implementation schedule, the permit writer should use the data and information supporting the prioritization of the CSO projects on the basis of their environmental impacts, as well as the analysis of financial status. EPA's *Combined Sewer Overflows—Guidance for Long-Term Control Plan* (EPA, 1995a) and *Combined Sewer Overflows—Guidance for Financial Capability Assessment* (EPA, 1995e) recommend criteria to evaluate the reasonableness of construction schedules and financing plans in the LTCP. After reviewing

these documents, the permit writer should refer to the following questions when reviewing the implementation schedule:

- Do any phased construction schedules consider:
 - Elimination of CSOs to sensitive areas
 - Use impairment?
- Do any phased construction schedules include an analysis of financial capability, such as the following factors:
 - Median household income
 - Total annual wastewater and CSO control costs per household as a percent of median household income
 - Overall net debt as a percent of full market property value
 - Property tax revenues as a percent of full market property value
 - Property tax collection rate
 - Unemployment
 - Bond rating?
- Did the permittee evaluate the following factors:
 - Grant and loan availability
 - Previous and current residential, commercial, and industrial sewer user fees and rate structures
 - Other viable funding mechanisms and sources of financing?
- Does the schedule include milestones for all major implementation activities, including environmental reviews, siting of facilities, site acquisition, and Army Corps of Engineers permitting?

The permit writer should review the financing plan to determine whether it provides the funds necessary to construct CSO controls and assess whether water quality considerations merit revisions to the proposed implementation schedule. If so, the permit writer may consider a revised schedule.

4.5.1.6 Operational Plan

In evaluating the operational plan, the permit writer should consider whether the permittee's O&M program addresses the evaluation criteria proposed in Section 4.4.1 for the

NMC. However, the permit writer should ensure the operational plan includes newly-selected CSO control structures.

4.5.1.7 Post-Construction Compliance Monitoring

The permit writer should review the monitoring plan with members of the review team who are knowledgeable about design and implementation of monitoring programs. When evaluating post-construction compliance monitoring, the permit writer should consider the following questions:

- Does the monitoring program include monitoring of CSOs that are representative of the impacts to receiving waters?
- Does the monitoring program include ambient receiving water body monitoring at representative CSOs, as well as monitoring prior to CSO impacts? Has the monitoring program for the receiving water body been coordinated with any ongoing or planned State programs and programs of other permittees within the same watershed?
- Does the monitoring program include any biological parameters (e.g., fish, zooplankton)?
- Does the monitoring program address pollutants included in the water quality criteria for the specific designated use(s) of the receiving water, pollutants key to the attainment of the designated use(s), and pollutants affected by the CSO controls?
- Does the monitoring program include appropriate measures of success?

Appendix B contains additional information on the review of a monitoring plan.

4.5.2 Implementation of the Long-Term Control Plan

As described in the CSO Control Policy, Phase II permits should contain "narrative requirements which ensure that the selected CSO controls are implemented, operated and maintained as described in the long-term CSO control plan." Because the CSO controls will have been selected on a site-specific basis, the implementation conditions should also be site-specific. Thus, the permit writer should not simply develop a generic permit condition that

requires implementation of the LTCP as developed, incorporating the LTCP into the NPDES permit by reference. Rather, the permit should contain specific conditions that require implementation of the selected CSO controls, the proposed O&M program requirements, and the proposed post-construction compliance monitoring program. The following subsections briefly discuss each of these portions of the LTCP.

4.5.2.1 Selected CSO Controls

The permit writer should develop permit conditions that specifically require the implementation of the selected CSO controls, once approved. As discussed above, due to the differences among CSSs, the CSO controls identified in LTCPs will vary from system to system. In many cases, the CSO controls will require major construction and implementation activities that can only be completed over several five-year NPDES permit cycles. The CSO Control Policy recommends that the LTCP include the information necessary to develop the fixed-date schedules for funding and implementing the CSO control program. The LTCP should prioritize the individual projects within the overall control program on the basis of environmental impacts, financial capability, and available funding. Section 3.5.1 provides additional discussions on the permittee's development of implementation schedules.

When the implementation schedules for the selected CSO controls are established, the permit writer should determine the appropriate mechanism for imposing the schedule on the permittee. As in the Phase I permit, the permit writer should require in the Phase II permit that the permittee meet applicable WQS. If implementing regulations explicitly authorize a compliance schedule, the permit writer may incorporate such a compliance schedule for the attainment of water quality-based effluent limitations into the Phase II permit. In all other cases, the Phase II permit must require immediate compliance with its technology- and water quality-based requirements. When the permittee is unable to comply immediately with these requirements (as will frequently be the case), the permit writer should include a fixed-date implementation schedule in an enforceable mechanism issued simultaneously with the Phase II permit. Appropriate enforceable mechanisms may include administrative or judicial orders. The

permit writer should discuss with the appropriate enforcement authority the choice of the mechanism to use in each situation.

Exhibit 4-3 provides example language requiring compliance with an LTCP implementation schedule for the selected CSO controls. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. (The example provided assumes that the permittee has successfully implemented the NMC, and that the schedule is only to implement the CSO controls identified in the LTCP.) In this permit requirement, the permit writer should list specific activities necessary to implement selected controls. For example, if one of the selected CSO controls is construction of a retention basin, the permit writer should include specific language for the various activities necessary to complete the construction, as shown in the italicized site-specific language in Exhibit 4-3. These activities and the corresponding completion dates should be taken directly from the LTCP whenever possible. In many instances, the LTCP might contain a combination of selected CSO controls, such as construction of additional retention basins, separation of portions of the CSS, and maximization of flow receiving primary treatment at the POTW treatment plant. In these cases, the permit writer should include activities with corresponding completion dates for implementing each of the selected CSO controls. In addition to identifying compliance dates within the implementation schedule, the permit writer should also require progress reports to demonstrate compliance with the various compliance dates. Section 4.8 provides additional guidance on appropriate reporting requirements for the Phase II permit.

4.5.2.2 Operational Plan

As described in Section 4.4.2, the permittee should have developed an O&M program as part of the NMC. Once the permittee has selected CSO controls in its LTCP, the permittee should revise the O&M plan developed and implemented as part of the NMC to include the selected CSO controls. Example permit requirements for implementing the O&M program are contained in Exhibit 4-2, given previously.

Exhibit 4-3. Example Permit Language for Implementing Selected CSO Controls**II. Long-Term Control Plan**

The permittee shall implement and effectively operate and maintain the CSO controls identified in the long-term control plan. The implementation schedule for these controls shall be as follows:

<u>Activity</u>	<u>Completion Date</u>
[insert name of activity]	[insert date]
<i>Site-Specific Language:</i>	
1. Retention basin	
• Complete design of [named] retention basin.	[insert date]
• Submit construction drawings for [named] retention basin.	[insert date]
• Initiate construction of [named] retention basin.	[insert date]
• Complete construction of [named] retention basin.	[insert date]
2. [Named street] sewer separation	
• Complete design.	[insert date]
• Solicit bids.	[insert date]
• Award contracts.	[insert date]

NOTE: A compliance schedule exceeding the term of the permit may only be included in the permit if explicitly authorized in the applicable State WQS.

4.5.2.3 Post-Construction Compliance Monitoring

Implementation of the post-construction compliance monitoring program proposed by the permittee as part of its LTCP generally is important for determining the overall effectiveness of the selected CSO control(s) in achieving compliance with the CWA. It might not be appropriate to require the implementation of a post-construction monitoring program until construction is well underway or completed. Section 4.7 presents further guidance on Phase II permit monitoring requirements.

4.5.2.4 Documentation for Fact Sheet/Statement of Basis

As discussed previously, the permit writer must prepare a fact sheet or statement of basis that describes the basis for all NPDES permit conditions. For Phase II permits that require the implementation of CSO controls selected in an LTCP, the permit writer should use the information from the LTCP to record in the fact sheet or statement of basis the justification for implementation of the specific CSO controls chosen by the permittee. In cases where the permit

writer has determined that the permittee's proposed control levels and selected CSO controls are not adequate to provide for the attainment of WQS, the permit writer should document the basis for such determination (i.e., explain why the CSO controls selected by the permittee are not adequate).

4.6 EFFLUENT LIMITATIONS

As with the Phase I permit and consistent with 40 CFR 122.44 (NPDES requirements), both technology- and water quality-based effluent limitations are included in the Phase II permit. However, these two permit phases differ with respect to the type of effluent limitation each permit phase should require. The CSO Control Policy provides that in Phase I, the permit writer should establish narrative water quality-based effluent limitations; by comparison, the CSO Control Policy recommends that Phase II water quality-based effluent limitations be expressed as numeric performance standards (e.g., number of overflow events per year) for the selected CSO controls. When sufficient CSO-related information and data are available for the permit writer to develop numeric water quality-based effluent limitations, the permit writer should do so. This information, however, is not likely to be available for inclusion in the Phase II permit.

4.6.1 Technology-Based Requirements

Phase II permits should require CSO permittees to continue implementation of technology-based controls. These technology-based controls generally include the NMC on a BPJ basis and may also include components of any additional technology-based controls selected in the LTCP. The permit writer should re-evaluate and incorporate appropriate NMC requirements in the Phase II permit, as discussed in Section 4.4. The discussion of the technology-based requirements presented in Section 3.6.1 is also applicable to Phase II permits.

4.6.2 Water Quality-Based Requirements

In developing water quality-based requirements for CSOs, the permit writer should have a thorough understanding of the applicable State WQS and any specific guidance related to wet

weather conditions. This information, in addition to the LTCP information, will provide the basis for the permit writer to develop the appropriate water quality-based requirements in the Phase II permit.

As described in Section IV.B.2 of the CSO Control Policy, Phase II permits should contain "Water quality-based effluent limits under 40 CFR 122.44(d)(1) and 122.44(k), requiring, at a minimum, compliance with, no later than the date allowed under the State's WQS, the numeric performance standards for the selected CSO controls,..." The CSO Control Policy assumes that adequate data will generally not be available at the beginning of the Phase II permitting process for the permit writer to fully and accurately assess the need for numeric water quality-based effluent limits. Consequently, the CSO Control Policy depends on compliance with the performance standards of the selected CSO controls to achieve water quality goals.

The performance standards to be applied to a permittee will depend on the selected CSO control approach. The CSO Control Policy specifies the performance standards for the presumption approach. To satisfy the demonstration approach, the permit writer should establish performance standards for the selected CSO controls that will provide for the attainment of WQS. The following subsections discuss the water quality-related considerations for each approach.

In addition to performance standards designed to meet WQS, the permit writer should include narrative permit language providing for the attainment of applicable WQS. In certain circumstances, sufficient data may exist (e.g., the permittee may have substantially completed construction of selected CSO controls) for the permit writer to develop numeric water quality-based effluent limits. EPA's *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) might provide useful insights on determining appropriate water quality-based effluent limitations. Although this EPA manual is intended to address **continuous** discharges, it may provide useful information for wet weather flows.

4.6.2.1 Presumption Approach

Where a permittee chooses (and the NPDES permitting authority authorizes) the presumption approach, he or she will likely be required to meet numeric performance standards (e.g., a certain number of overflow events per year). These criteria were established in the CSO Control Policy because "data and modeling of wet weather events often do not give a clear picture of the level of CSO controls necessary to protect WQS." The CSO Control Policy presumes, therefore, that compliance with these numeric performance standards generally will be sufficient to meet WQS. The permit writer will be responsible, however, for ensuring that this presumption is reasonable for the CSOs to be permitted. To determine whether the presumption approach is reasonable, the permit writer should review the data generated and analysis conducted to characterize, monitor, and model the CSS and to review the consideration of sensitive areas by the permittee.

Exhibit 4-4 provides example permit language for a permittee that uses the presumption approach. The permit writer should evaluate this language carefully to ensure that it is appropriate for the permittee. (The example permit language addressing disinfection requirements specifically requires reduction of a pathogen indicator (e.g., *E. coli*) to levels that will provide for attainment of WQS. This example language assumes that such a standard exists. In addition, the example permit language assumes that the control of harmful disinfection products (e.g., chlorine) might be necessary. In both cases, the permit writer should customize the disinfection requirements to those required to meet State WQS.)

The permit writer will be responsible for eventually reviewing the permittee's evaluation of CSO controls and determining whether water quality will be adequately protected. It is likely that an adequate demonstration and review for attainment of WQS will not be possible until the permittee has implemented its selected CSO controls. Therefore, the permit writer might not complete an evaluation, including consideration of the development of numeric water quality-based effluent limitations, until the post-Phase II CSO permitting. In any case, use of the presumption approach does not shield a permittee from the possibility that additional controls might eventually be necessary in order to attain water quality objectives.

Exhibit 4-4. Example Permit Language for Performance Standards for the Presumption Approach

I. Effluent Limits

B. Water quality-based requirements for CSOs

The permittee shall not discharge any pollutant at a level that causes or contributes to an in-stream excursion above numeric or narrative criteria adopted as part of [insert State name] water quality standards.

The permittee shall comply with the following performance standards. These standards shall apply during [insert average design conditions upon which controls are based].

1. [The permit writer should select the appropriate standard below.]

The permittee shall discharge no more than an average of [insert appropriate number: 4, 5, or 6] overflow events per year not receiving the treatment specified below.

[or]

The permittee shall eliminate or capture for treatment, or storage and subsequent treatment, at least 85 percent of the system-wide combined sewage volume collected in the combined sewer system during precipitation events under design conditions. Captured combined sewage shall receive the treatment specified below.

[or]

The permittee shall eliminate or remove the following mass of pollutants from the combined sewage volume collected in the combined sewer system during precipitation events under design conditions:

[insert x] pounds of [insert pollutant]

[insert y] pounds of [insert pollutant]

[Insert the following language only if the first or second alternative is chosen above.]

Any combined sewage captured shall receive a minimum of the following treatment:

- Primary clarification or equivalent.
- Solids and floatables disposal.
- [Insert appropriate disinfection requirements as necessary to meet State WQS.]
- Disinfection. Fecal coliform counts shall be maintained below [insert applicable level].
- [Insert appropriate dechlorination requirements if applicable based on State WQS.]

4.6.2.2 Demonstration Approach

Under the demonstration approach, the permittee should be required to show that the selected CSO controls will not cause or contribute to the exceedance of WQS. In a receiving water with pollution sources other than the permittee's CSOs, this may be accomplished through the watershed approach. The permit writer will be responsible for ensuring that the permittee demonstrates that the selected CSO controls are adequate to provide for the attainment of WQS. The specific performance standards that should be included in a permit will depend on the CSO

controls selected. This manual does not provide example permit language for the demonstration approach because such language will be site-specific and based on the permittee's demonstration. However, the permit writer should attempt to draft permit language in terms of performance standards or other clear specific standards similar in type to the examples provided in Exhibit 4-4 for the presumption approach. Not all selected CSO controls (e.g., extensive use of BMPs) lend themselves to specific numeric performance standards. However, the permit writer should still attempt to develop permit conditions that will hold the permittee accountable for implementing CSO controls as planned (e.g., specifying implementation and scheduled evaluation of BMPs).

4.7 MONITORING

Monitoring is generally necessary to 1) evaluate the water quality impacts from CSOs on receiving waters and the effectiveness of CSO controls and 2) determine compliance with permit conditions and ultimately the attainment of WQS. The first type of monitoring should be conducted during the Phase II permit term and should be sufficient to evaluate water quality impacts of CSOs on the receiving water bodies and to evaluate the effectiveness of CSO controls during the construction/implementation period. The latter type of monitoring should be conducted after construction of selected CSO controls has been completed and should be required in the first post-Phase II permit (see Chapter 5).

The proposed post-construction compliance monitoring plan should be submitted as part of the LTCP. The plan should describe a monitoring program that includes receiving water monitoring at the CSO outfall and outside the area of CSO impact. The types of pollutants and parameters to be included in either of these monitoring programs depend on the WQS in the receiving water body and might include chemical (e.g., biochemical oxygen demand, total suspended solids, metals, oil and grease, herbicides, pesticides), microbiological (e.g., fecal coliform), and biological (e.g., fish, benthic invertebrates, zooplankton) parameters. It is critical that the receiving water monitoring be coordinated with ongoing or planned State programs and monitoring efforts of other permittees within the same watershed to ensure effective use of resources by all parties.

Permit monitoring conditions should be clear and concise, maintaining flexibility to account for site-specific factors. Where possible, to ensure that the conditions are enforceable, the permit writer should develop permit conditions that incorporate specific elements of the submitted plan rather than general requirements. The permit writer may copy specific portions of the proposed plans into the permit.

Exhibit 4-5 presents an example of site-specific permit language. (The pollutants listed in Exhibit 4-5 are included as an example only and are not intended as a mandatory list of required monitoring parameters. Permit language and the list of pollutants to be monitored should be developed to reflect the permittee's site-specific characteristics.) In addition, the permit writer should require the permittee to monitor appropriate measures of success, developed as part of the LTCP.

EPA cautions the permit writer against requiring implementation of the monitoring plan by reference. This approach might be more difficult to enforce because of the possible ambiguity of such language.

If CSOs are causing substantial water quality impacts, the permit writer may want to require special characterization studies, including the following:

- Sediment studies
- Whole effluent toxicity testing
- Biological assessments.

This type of monitoring, generally a short-term study, can be required as a special condition. Typically, such a study is required in response to specific information indicating that water quality is being affected. The permit writer may want to develop permit conditions that require: 1) a separate monitoring plan to be developed for each special study, 2) the plan be submitted for review prior to performing the monitoring, and 3) the submission of a final report to the permitting authority within a specified time after study completion.

Exhibit 4-5. Example Permit Language for Site-Specific Monitoring Activities

<i>Site-Specific Language:</i>				
<i>The permittee shall monitor CSOs and report results to the permitting authority in accordance with the following:</i>				
Characteristic			Monitoring Requirements	
Reporting Code	Units	Parameter*	Measurement Frequency	Sample Type
		Ammonia		Grab
		Ammonia		Composite
		BOD ₅		Grab
		BOD ₅		Composite
		Phosphorus		Composite
		Total Suspended Solids		Grab
		Total Suspended Solids		Composite
		Fecal Coliform Bacteria		Grab
<p>1. The grab sample shall be collected within [insert appropriate number] minutes of the discharge at the following CSO outfalls [insert appropriate identification]. The grab sample shall be collected [insert appropriate number] times per year.</p> <p>2. The composite sample shall be collected from the start of the discharge until it stops, with the sample period not to exceed 24 hours at the following CSO outfalls [insert appropriate identification]. The composite sample shall be collected [insert appropriate number] times per year, [insert appropriate number] times during the period from May - October and [insert appropriate number] times during the period from November - April. The permittee shall submit the results no later than November 30th and May 31st, respectively.</p> <p>*Parameters listed in this exhibit are examples only. The list of parameters to monitor must be developed on a site-specific basis.</p>				

The permit writer should review the monitoring plans carefully to verify that the design ensures that CSO information is correlated with water quality impacts; otherwise, the results of the studies might not provide conclusive evidence of the cause of impact. In addition, other studies might be needed in conjunction with these special studies. For example, sediment studies might not be meaningful without a contaminant transport modeling study, and a bioassay performed without toxicity data and CSO data might not provide meaningful results.

For additional information on these types of testing, the permit writer is referred to the *Combined Sewer Overflows—Guidance for Monitoring and Modeling* (EPA, 1995d).

4.8 REPORTING

Four types of reporting requirements relating to CSO controls should be included in the Phase II permit: 1) re-evaluations associated with and reports/recordkeeping to document continued implementation of the NMC, 2) progress reports associated with implementation of long-term CSO controls, 3) monitoring data, and 4) other pertinent information (e.g., sensitive area reassessment):

- **NMC Implementation**—Examples of recordkeeping requirements associated with the ongoing implementation of the NMC have been incorporated into the example permit language associated with NMC implementation (see Section 4.3.2). The permit writer may choose to require reporting of any of this information. In addition, if the permit writer chooses to require any re-evaluations associated with any of the minimum controls, such as a reassessment of the pretreatment program or additional revisions to the municipal ordinance, the permit writer may require reporting of these re-evaluations.
- **LTCP Implementation - Progress Reports**—Because the implementation of the LTCP may be phased, the permit writer may require progress reports associated with the implementation of CSO controls. Exhibit 4-6 presents example permit language for requiring the submission of progress reports.

Exhibit 4-6. Example Permit Language for Requiring Submission of Progress Reports

Within 14 days of each completion date specified in [insert appropriate section] of this permit, the permittee shall submit a written progress report to the permitting authority stating whether or not the particular activity was completed. If the activity was not completed, the report shall also include (1) an explanation of the failure to accomplish the activity, (2) actions taken by the permittee to correct the situation, and (3) an estimate of when the activity will be completed.

- **Monitoring Data**—Monitoring data collected during Phase II should be submitted to the NPDES permitting authority on a scheduled basis. Exhibit 4-5 provides example permit language that includes reporting requirements for Phase II monitoring.
- **Other Information**—The permit writer should consider other applicable reporting requirements. Depending on whether the permittee has chosen to implement the presumption or the demonstration approach, for example, it might be appropriate to require the permittee to report the number of overflow events or document other